Amaduvade Finches (*Estrelda amandava*), a Green Waxbill (*Estrelda formosa*), two Black-headed Finches (*Munia malacca*), two Chestnut-bellied Finches (*Munia rubro-nigra*), three Indian Silver-bills (*Munia malabarica*) from India, a Common Waxbill (*Estrelda cinerea*), three Orange-cheeked Waxbills (*Estrelda melpoda*), two Red-bellied Waxbills (*Estrelda rubriventris*), a Paradise Whydah Bird (*Vidua paradisea*), a Grenadier Weaver Bird (*Euplectes oryx*) from West Africa, three Banded Grass Finches (*Poëphila cincta*) from Queensland, a Bar-breasted Finch (*Munia nisoria*) from Java, a Maja Finch (*Munia maja*) from Malacca, a Chestnut-eared Finch (*Amadina castanotis*) from Australia, presented by Miss Petrocochino; two Black Rats (*Mus rattus*) from the Channel Islands, presented by Mr. J. Ernest Ardron; a Common Otter (*Lutra vulgaris*), British, presented by Mr. A. P. Ashburnham; three Hairy-footed Jerboas (*Dipus hirtipes*) from North-east Africa, presented by Miss Baird; a Green-cheeked Amazon (*Chrysotis viridigena*) from Colombia, deposited; a Collared Fruit Bat (*Cynonycteris collaris*), a Yellow-cheeked Lemur (*Lemur xanthomystax*), a Crested Porcupine (*Hystrix cristata*), two Squirrel-like Phalangers (*Petaurus sciureus*), a Red Kangaroo (*Macropus rufus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN MAY:—

May 2.	11h. 24m. to 12h. 11m. B.A.C. 4006 (mag. 5·7) occulted by the moon.
2.	21h. Jupiter in conjunction with moon. Jupiter 6° 58′ N.
6.	Vesta (mag. 6·5) in opposition to the sun. In Libra.
7.	6h. 36m. α Scorpii (Antares) in conjunction with moon. α Scorpii, 1¼° S.
7.	12h. Saturn in conjunction with moon. Saturn 5° 7′ N.
11.	13h. 16m. to 13h. 51m. B.A.C. 7263 (mag 6) occulted by moon.
13.	Uranus 52′ S. of β Scorpii (mag. 3).
15.	Venus. Illuminated portion of disc 0·923.
15.	Mars. ,, ,, ,, 0·936.
18.	18h. Venus in conjunction with Neptune. Venus 2° 19′ N.
20.	Saturn. Outer minor axis of outer ring, 18″·69.
20.	Ceres 16′ N. of β Geminorum (Pollux).
22.	4h. Uranus in opposition to the sun. In Scorpio.
22.	6h. 54m. to 7h. 32m. Venus occulted by moon.
24.	Encke's Comet arrives at perihelion.
29.	22h. Saturn in opposition to the sun. In Scorpio.
30.	5h. Jupiter in conjunction with moon. Jupiter 7° 1′ N.

DOUBLE AND MULTIPLE SOUTHERN STARS.—The observation of double and multiple stars in the southern heavens has never been attempted on a large scale, although several observers have turned their attention to these bodies with not very large apertures. Sir John Herschel, in his southern sweep for nebulæ and clusters, was enabled to detect over 2000 new double stars; but his chief interest was more for the close examination of the former celestial objects than for the search for double stars. Since that time the Sydney Observatory, the Cape Observatory, and the Harvard observers at Arequipa have done much to promote our knowledge of this class of southern stars. A search on a large scale has recently been undertaken by Dr. T. J. J. See, who was invited by Mr. Lowell to undertake a survey of the southern heavens for the discovery and measurement of new double stars and nebulæ with the 24-inch refractor, which had just been completed by the Clarks. In the *Astronomical Journal* (Nos. 431–432) Dr. See gives us some details of his plan of work, together with the first part of the catalogue of new double stars. In this survey Dr. See was aided by Mr. Cogshall. The observing station was first at Mars' Hill, Flagstaff; next in Mexico, in the western part of Tacubaya; and then again at Flagstaff, the telescope in each case being dismounted and re-erected.

The region of the sky embodied in this work includes the entire zone between −20° and −45°, and the more southern region swept over in Mexico lies between −45° and −65° between 4h. and 16h. Right Ascension. Dr. See states: "In the course of this work it is certain that we have examined carefully not less than one hundred thousand stars, and many of them doubtless on several occasions." All the star places have been referred to the equator and mean equinox of 1900·0, and in each case the colours are given after a terminology which was found best to describe the tints of the spectrum. To give an idea of the quality of the object-glass used, and the excellent atmospheric conditions at Flagstaff, we may mention that an object was not considered difficult unless it was below 0″·3, or fainter than the 14th magnitude for fairly wide objects. Dr. See proposes to arrange the final catalogue in two parts: the first giving the new doubles, and the second doubles recognised by previous observers. He further uses the symbol λ to denote "stars discovered at the Lowell Observatory," and an index 1 being affixed to this letter in the first catalogue, and other numbers in subsequent catalogues. When completed, this great work will prove a most valuable contribution to our knowledge of many interesting systems in the southern hemisphere.

COMET PERRINE.—The following is a continuation of the ephemeris given previously in this column:—

12h. Berlin Mean Time.

1898.	R.A.			Dec.		log *r*	log Δ	Br.
	h.	m.	s.	°	′			
April 28	0	20	32	+49	28·1			
29		25	59	49	56·0			
30		31	26	50	22·6	0·1171	0·2675	0·52
May 1		36	53	50	48·0			
2		42	21	51	12·3			
3		47	49	51	35·4			
4		53	16	51	57·4	0·1285	0·2799	0·47
5	0	58	43	+52	18·3			

THE MANORA OBSERVATORY.—In a recent number of the *Naturwissenschaftliche Wochenschrift* (Band xiii. No. 14), Herr Leo Brenner gives a condensed account of the observations made at the Manora Observatory during the past year. As usual, the observations are chiefly restricted to minute examinations of the surface markings of planets. The article is illustrated by reproductions of the observatory and instruments and drawings of the surface markings of some of the planets. Herr Brenner refers to the question that has been raised regarding the financial condition of the observatory. In his concluding remarks he adds: "For the main part my work this year will depend on whether a change occurs in the financial condition of the observatory, or whether I shall be obliged, as formerly, to waste my time in writing worthless scientific articles."

THE HARVARD COLLEGE OBSERVATORY.—The fifty-second annual report of the director of the Astronomical Observatory of Harvard College gives us an idea of the immense amount of work which is being carried on so successfully under his supervision. Not only are extensive investigations undertaken, but they are brought to completion by the liberal staff with which he is provided. After referring to the large endowment for current expenses which renders such assistance possible, Prof. Pickering adds that as regards permanent plant they are far behind other observatories even of the second class. That this will be soon remedied there is no doubt; and Prof. Pickering has the happy faculty of knowing from which direction such donations will come, for he says, "the need of modern buildings is most likely to be supplied by gifts or bequests from persons whose names should be attached to them. For instance, a library building in which the clerical work of the institution could be performed is greatly needed. A modern machine-shop to replace our present workshop would form an excellent memorial of one who had been interested in the application of the mechanic arts to scientific uses." As usual, each of the instruments has been used for extensive investigations. The east equatorial has been employed for photometric light comparisons of variables mostly with the new polarising photometer, while the west instrument has been used for similar observations of variables and comparison stars. The meridian circle and meridian photometer have also been continuously employed, Prof. Pickering having worked with the latter on 152 nights, and made 100,052 photometric settings. The researches planned for this latter instrument are, we are told, approaching completion, 860,000 measures of about 40,000 stars having been made during the last twenty years. Both the 8-inch telescopes have been used for photographing stellar spectra, the number of photographs

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obtained being 6054. The 11-inch Draper telescope has been employed for photographically recording the satellites of Jupiter undergoing eclipse, and variables of the Algol type. Mr. King, who has been investigating the effects of differential refraction and flexure on the form of the photographic images, has found that an equatorial should never be driven on sidereal time, but that satisfactory images have been obtained by photographing at suitable hour angles with a mean time driving clock, the rate being wholly corrected by the refraction in right ascension. Experiments are now being made to introduce a flexure correction automatically. In this connection it is interesting to refer to the work done by Dr. Rambeau. With regard to the other departments under the direction of Prof. Pickering, we must limit ourselves here to mentioning them: namely, the Boyden department at Arequipa, where the new Bruce photographic telescope has been erected, and the Blue Hill Observatory, although they have both been contributing valuable observations during the last twelve months.

THE NATURE AND HABITS OF PLINY'S SOLPUGA.

ALTHOUGH next to nothing is known of the past history of the spider-like creatures discussed in the following pages, it is tolerably certain that since glacial times they have been confined in their distribution, so far as Europe is concerned, to Spain, Greece and South Russia. Since, therefore, they were certainly unknown to our British and Anglo-Saxon ancestors, and probably also to the early Romans, it is not surprising that the English language has no name for the group of which they are members. To the ordinary Englishman they are spiders, and as spiders or tarantulas they are usually described by travellers who have come across them in India, Egypt and elsewhere. The Greeks, on the contrary, who were doubtless acquainted with the species inhabiting their own country and Asia Minor, seem to have recognised them from the ordinary spider, since they had a distinctive name for each of the two groups. The spiders were called Arachne (ἀράχνη); the others Phalangium (φαλάγγιον), in allusion to their five pairs of long-jointed limbs. Ælian, for example, tells how a country in Æthiopia was deserted on account of the appearance of incredible numbers of Scorpions and Phalangiums. But Pliny, when quoting the same story, introduces Solpuga[1] in place of Phalangium. And since the latter is now used in systematic zoology for a totally different group, namely for the so-called Harvest or Long-legged Spiders, so abundant throughout Europe, no further reason need be given for adopting Pliny's name for the species now under discussion.

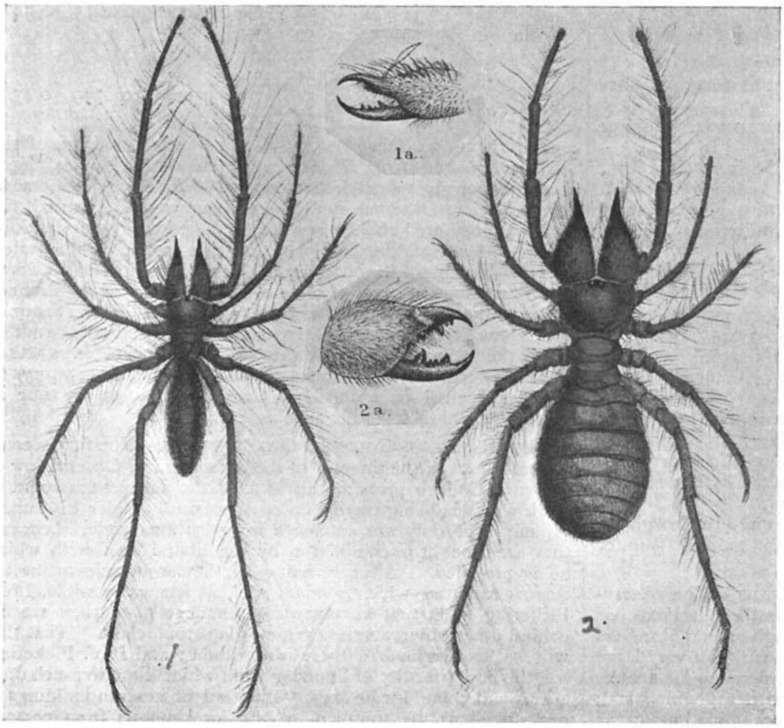

FIG. 1.—Indian Solpuga (*Galeodes fatalis*).—1, male; 1*a*, jaw of male seen from the side; 2, female; 2*a*, jaw of female seen from the side. (Figs. 1 and 2 reduced to three-fourths the natural size)

So much by way of preface. But before leaving the ancient history of the Solpuga, it may be interesting to mention a suggestion that has been made to the effect that the Hebrew word translated Mouse in the Old Testament referred to some sort of Solpuga; and that the sores, the emerods (hæmorrhoids), from which the Philistines suffered, resulted from the bites of these creatures. In support of this supposition may be urged the unmistakable resemblance to mice presented by some of the smaller, dark-coloured, short-legged species, with their hairy bodies and rapid movements, which occur both in Egypt and Syria; and the statements of travellers to the effect that at the present time they inflict painful bites upon people when asleep in the desert at night.

It is beyond the scope of the present article to deal with the many points of interest connected with the anatomy of these animals. Nor is it necessary to point out all the distinctive features which serve to separate them from the true spiders, the only members of the class Arachnida with which they are likely to be confounded. Suffice it to say that the term spider, doubtless a corruption of spinner (spinster), is technically applied exclusively to the familiar web-spinners, and that no silk glands exist in any members of the order Solifugæ.

The general form is well shown in the annexed illustration depicting the male (Fig. 1) and the female (Fig. 2) of a North Indian species called *Galeodes fatalis*. As will be seen, the sexual differences are very striking, the male being both smaller and lighter in build, with the head narrower and the jaws less bulky; the legs, on the contrary, are unmistakably longer. This correlation between lightness of body and length of limb points to much greater activity on the part of the male, a superiority which no doubt stands him in good stead at the pairing time, when the female has a habit, it is alleged, of killing and devouring her less powerful mate. Again, in addition to being smaller, the jaws of the male (Fig. 1*a*) are always less strongly toothed than those of the female (Fig. 2*a*), and are furnished on the upper side with a peculiar organ of unknown function called the *flagellum*.

In both sexes, but especially in the female, the jaws attain a development unequalled elsewhere in the class Arachnida (Spiders, Scorpions, Solpugas, &c.). They are, in fact, admirably adapted for the purpose of crushing hard-shelled beetles and other insects. But they also have another duty to perform, namely, that of digging; for the females, at least at the breeding season, excavate subterranean burrows for the protection of themselves and their young. The process has been observed in the case of the species here figured. Choosing a suitable spot, the female proceeded to cut away the earth in a circle with her jaws, then kicked away the loosened fragments with her legs, or scraping them together into a heap with the palpi [the long front pair of legs], pushed the pile by main force from the entrance of the burrow. At its opposite end the eggs, about fifty in number and resembling a mustard-seed in size and shape, were laid, and hatched about a fortnight afterwards. For

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[1] This word is, perhaps, a corruption of *Solifuga* or *Solipugna*, which seem also to have been in use. The former means a creature which flees from the sun; the latter one that battles against it, and so hates or is intolerant of it.

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